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PATENT APPLICATION

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re application of

Docket No: Q53233

Hyun-doo SHIN, et al.

Appln. No.: 09/497,520

Group Art Unit: 2626

Confirmation No.: 7584

Examiner: GRANT II, JEROME

Filed: February 4, 2000

For: COLOR IMAGE PROCESSING METHOD AND APPARATUS THEREOF

SUBMISSION OF APPELLANTS' BRIEF ON APPEAL

MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

Submitted herewith please find an original and two copies of Appellant's Brief on Appeal. A check for the statutory fee of \$330.00 is attached. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this paper is attached.

Respectfully submitted,

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WASHINGTON OFFICE

23373

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APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192

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Sir:

In accordance with the provisions of 37 C.F.R. § 1.192, Appellants submit the following:

I. REAL PARTY IN INTEREST

The real parties in interest are Samsung Electronics Co., Ltd. and The Regents of the University of California, by virtue of assignments executed by Hyun-doo Shin, Yang-lim Choi, Yening Deng, and Bangalore Manjunath (Appellants hereafter), on December 28, 2000, December 28, 2000, October 11, 2000 and September 26, 2000, respectively, and recorded by the Assignment Branch of the U.S. Patent and Trademark Office on January 31, 2001 (at Reel 011487, Frame 0340 and Reel 011484, Frame 0627).

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II. RELATED APPEALS AND INTERFERENCES

To the knowledge and belief of Appellants, the Assignee, and the undersigned, there are no other appeals or interferences before the Board of Appeals and Interferences that will directly affect or be affected by the Board's decision in the instant Appeal.

III. STATUS OF CLAIMS

Claims 1-22, 24-27, 29-36, and 38-50 are pending in the application.

Claims 1, 2, 19, 22, 38, 39, 44, 45, and 50 are rejected under 35 U.S.C. §102(b) as being anticipated by Young (US 5,473,736).

Claims 3-18, 20, 21, 24-27, 29-37, 40-43, and 46-49 are objected to as being dependent upon rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the rejected base claims and any intervening claims.

The appealed claims are claims 1, 2, 19, 22, 38, 39, 44, 45, and 50.

IV. STATUS OF AMENDMENTS

All amendments have been entered in the present application.

V. SUMMARY OF THE INVENTION

The present invention relates to a color image processing method, which is a processing method required for retrieving a color feature descriptor used in indexing and searching a color image, and an apparatus therefor.

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An exemplary embodiment of Appellants' invention includes a color image processing apparatus (FIG. 2), including a sorting unit 202 for setting a window of a predetermined size within an input color image and sorting image pixels in the window according to a color distance between the image pixels and a central pixel, a grouping unit 206 for grouping the sorted pixels into groups in which a difference in an intragroup color distance is minimum and a difference in an intergroup color distance is maximum, and a filtering unit 208 for performing filtering by replacing a central pixel value with a predetermined pixel value determined by pixel values of pixels in the groups. See the present specification at page 10, line 11 – page 11, line 16.

VI. ISSUES

Whether the Examiner's rejection of claims 1, 2, 19, 22, 38, 39, 44, 45, and 50 under 35 U.S.C. § 102(b) is proper.

VII. GROUPING OF CLAIMS

For the purposes of the present appeal, the rejected claims do not stand or fall together. Specifically, the rejected claims are divided into the following separately patentable groups.

Group 1: Claims 1, 2, 19, 22, 39, 44, 45, and 50.

Group 2: Claim 38.

The Arguments section below provides arguments in support of the separate patentability of the groups, beginning on the following pages: Group 2, page 5.

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VIII. ARGUMENTS

Appellant respectfully submits that the claims are not anticipated by Young.

Group 1

Group 1 includes claims 1, 2, 19, 22, 39, 44, 45, and 50. Claims 1, 19 and 45 are independent. Claim 2 depends from claim 1, claim 22 depends from claim 19, claim 44 depends from claim 39, and claim 50 depends from claim 45.

Group 1, Argument: Young does not teach or suggest grouping sorted pixels into groups in which a difference in intragroup color distance is minimum and a difference in intergroup color distance is maximum.

In the Amendment filed January 2, 2004, Appellants argued that Young does not teach or suggest grouping sorted pixels into groups in which a difference in intragroup color distance is minimum and a difference in intergroup color distance is maximum. In response thereto, the Examiner asserts that the limitation is taught by col. 9, lines 44-46 regarding the sorting (ordering) of pixels having a minimum color distance and sorting (ordering) of pixels having a maximum color distance. See "Examiner's Remarks" on pages 5-6 of the Office Action dated February 25, 2004. However, col. 9, lines 44-46 only disclose that "a color C_j is selected which is the color C_n which is the smallest distance from the initial reference color C_R ." Appellants submit that this excerpt of the reference fails to disclose grouping sorted pixels into groups in which a difference in intragroup color distance is minimum and a difference in intergroup color distance is maximum. The cited excerpt is silent regarding intragroup and intergroup color distances, instead only generally disclosing a color which is the smallest distance from an initial reference color.

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In the Advisory Action of June 10, 2004, the Examiner asserts that the intragroup consists of all N colors of pixels within a group of P1 ... Pn. See col. 9, lines 45-53 of Young. The group P1 ... Pn represents a group of pixels. However, this group of pixels is not disclosed as having a difference in intragroup color distance that is minimum and a difference in intergroup color distance that is maximum.

Therefore, claim 1 is not anticipated by Young.

Appellants submit that claims 2, 19, 22, 39, 44, 45 and 50 are not anticipated by Young for reasons analogous to those presented above in relation to claim 1.

Appellant respectfully requests the reversal of the rejection of the claims of Group 1 for the above-described reasons.

Group 2

Group 2 includes independent claim 38, which is believed to be separately patentable from the claims of Group 1 due to the recitation of defining a window having a predetermined size within an input color image.

Group 2, Argument: Young fails to teach or suggest defining a window having a predetermined size within an input color image.

In the January 2 Amendment, Appellants argued that Young does not teach or suggest defining a window having a predetermined size within an input color image, as recited in claim 38. The Examiner refers to FIGS. 6A and 6B, as allegedly disclosing this feature of the claim, but Appellants disagree. As disclosed in Young at col. 9, line 58 - col. 10, line 4:

FIG. 6A is a standard representation of Munsell color space 40 which is a cylinder which has polar coordinates (radius Y and angle X) and height Z. FIG. 6B is a trajectory 42 through the Munsell color space 40. The ordered file of

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second storage means 26 contains the trajectory 42 of the colors through the Munsell color space 40 generated by selecting the smallest incremental distance between colors (features) from the source file. (As a tie-breaking scheme, the trajectory 42 may be tested for the shortest distance over successive points.) The trajectory 42 according to the invention is on a single value plane, i.e., more precisely, it is independent of the value. The ordered file is a signature which uniquely represents the color usage of an image as a mathematical function in a multidimensional space.

In other words, FIGS. 6A and 6B illustrate a Munsell mathematical coordinate system for assigning numerical values to colors, not a window. Appellants submit that a color space, such as the Munsell color space 40, simply is not a window.

In the Advisory Action, the Examiner asserts that Young describes a 3-D window. However, the Munsell color space 40 is a 3-D geometrical representation of colors of images, rather than a window having a predetermined size within a color image. In other words, the Munsell color space illustrates the colors of an entire image. By contrast, the Munsell color space does not define a window having a predetermined size within a color image.

Also in the Advisory Action, the Examiner asserts that the Appellant argued that the Munsell color space of Young is not directed to an input color image, but Appellants did make such an argument. Rather, Appellant argued that Young does not define a window within a color image, which is discussed above.

Hence, Appellants submit that claim 38 is not anticipated by Young for at least these reasons.

Appellants respectfully requests the reversal of the rejection of the claim of Group 2 for the above-described reasons.

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IX. CONCLUSION

Appellants respectfully request the members of the Board to reverse the rejection of all appealed claims and to find each of the claims allowable as defining subject matter which is patentable over the applied reference.

The present Brief on Appeal is being filed in triplicate. Unless a check is submitted herewith for the fee required under 37 C.F.R. §1.192(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


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APPENDIX

CLAIMS 1, 2, 19, 22, 38, 39, 44, 45, and 50 ON APPEAL:

1. A color image processing method comprising the steps of:

- (a) sorting image pixels according to a color distance between image pixels and a central pixel;
- (b) grouping the sorted pixels into groups in which a difference in intragroup color distance is minimum and a difference in intergroup color distance is maximum; and
- (c) performing filtering by replacing a central pixel value with a predetermined pixel value determined by pixel values of pixels in the groups.

2. The color image processing method according to claim 1, further comprising the step of defining a window having predetermined size within an input color image, wherein the image pixels are pixels within the window.

19. A color image processing method comprising the steps of:

- (a) receiving a color image frame and segmenting the same into a plurality of color images by a predetermined segmentation method;
- (b) sorting image pixels according to a color distance between the image pixels and a central pixel, with respect to an image selected among the segmented color images;
- (c) grouping the sorted pixels into groups in which a difference in an intragroup color distance is minimum and a difference in an intergroup color distance is maximum; and
- (d) performing filtering by replacing a central pixel value with a predetermined pixel value determined by pixel values of pixels in the groups.

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22. The color image processing method according to claim 21, wherein the predetermined number is less than or equal to $L/2$, in which L is a predetermined positive integer indicating the size of and $L \times L$ window.

38. A color image processing method comprising the steps of:

- (a) defining a window having a predetermined size within an input color image;
- (b) selecting pixels having a color vector similar to that of a central pixel within the window and defining the selected pixels as a group; and
- (c) performing filtering of blurring using only the pixels within the defined group.

39. A computer readable medium having program codes executable by a computer to perform a color image processing method, the method comprising the steps of:

- (a) defining a window having a predetermined size within an input color image;
- (b) sorting image pixels according to a color distance between the image pixels and a central pixel;
- (c) grouping the sorted pixels into groups in which a difference in an intragroup color distance is minimum and a difference in an intergroup color distance is maximum; and
- (d) performing filtering by replacing a central pixel value with a predetermined pixel value determined by pixel values of pixels in the groups.

44. The computer readable medium according to claim 39, wherein the color image processing method further comprises the step of receiving a color image frame and segmenting the same into a plurality of color images by a predetermined segmentation method, wherein the color image is an image selected from a plurality of color images.

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45. A color image processing apparatus comprising:

sorting means for setting a window of a predetermined size within an input color image and sorting image pixels in the window according to a color distance between the image pixels and a central pixel;

grouping means for grouping the sorted pixels into groups in which a difference in an intragroup color distance is minimum and a difference in an intergroup color distance is maximum; and

filtering means for performing filtering by replacing a central pixel value with a predetermined pixel value determined by pixel values of pixels in the groups.

50. The color image processing apparatus according to claim 45, further comprising segmenting means for receiving a color image frame and segmenting the same into a plurality of color images by a predetermined segmentation method, wherein the color image is an image selected from the plurality of color images.